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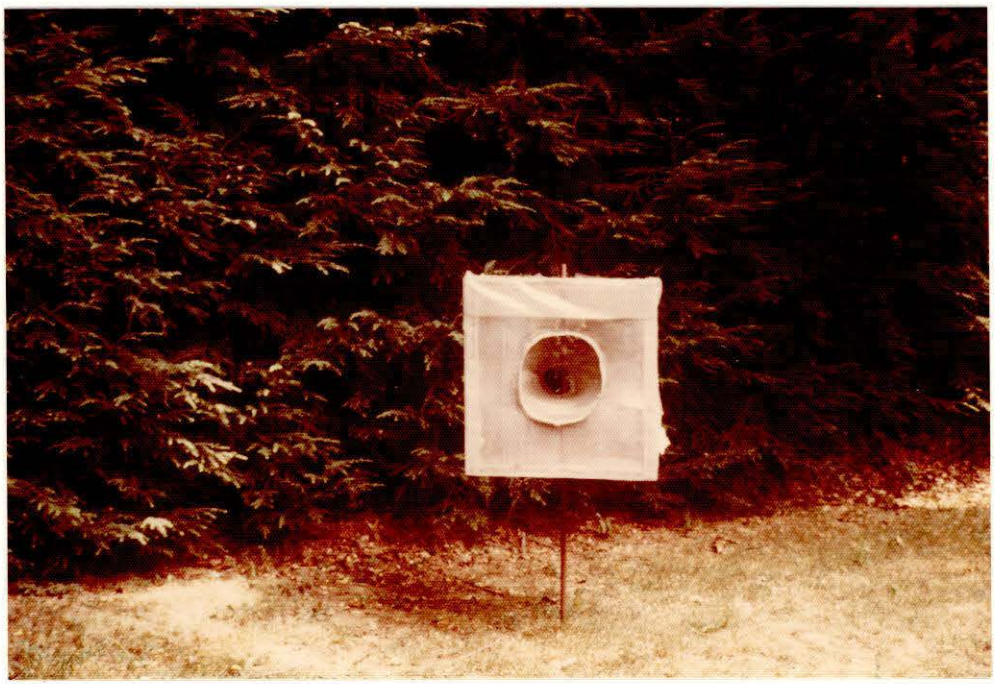
MALE PEACH TREE BORER PHEROMONE TRAP CATCHES AT TWO LOCATIONS - ASHEVILLE AND MURPHY, NC 1978



SOUTHEASTERN AREA, STATE & PRIVATE FORESTRY
USDA FOREST SERVICE, ATLANTA, GA 30309

COVER PHOTOGRAPH

Male peach tree borer pheromone trap.

MALE PEACH TREE BORER PHEROMONE TRAP CATCHES AT TWO LOCATIONS - ASHEVILLE AND MURPHY, NC 1978

By

Larry R. Barber[1/]

INTRODUCTION

Hardwood seed orchard establishment and seed production are new to southern tree improvement programs. In comparison, pine tree improvement work has been underway for several decades, with some 10,000 acres of pine orchards now established.

Insect problems on pine orchards have been documented by many scientists including DeBarr[2/], Merkel[3/] and others. In comparison, work on insects affecting hardwood seed orchards is virtually nonexistent.

The U. S. Forest Service has established a hardwood clone bank near Murphy, North Carolina, containing several oak species, poplar and black cherry.

The chief insect threat to the black cherry at this time is thought to be the peach tree borer, Synanthedon exitiosa (Say). The larvae of this insect causes damage or death to the tree by burrowing under the bark. The attacks occur 2-3 inches (5-7.6 cm) below the soil to 10 inches (25.4 cm) above. In order to control this pest, a long-term residual protective chemical spray must be applied to the tree trunks. In 1977 and 1978, the cherries were treated the latter part of August with one application of Thiodan®.

In 1977, exploratory work with peach tree borer pheromones (ZZ) at the orchard indicated male moths were active in the early summer. When male moths are present it is assumed the female egg laying moths are also present. In fact, the males may be present slightly before the females. This time difference is probably insignificant.

1/ Larry R. Barber, Entomologist, USDA, Forest Service, SA, S&PF, Asheville, NC.

2/ Gary L. DeBarr, USDA, Forest Service, Forest Insects - loblolly pine ecosystem, SEFES, Athens, GA.

3/ Edward P. Merkel, USDA, Forest Service, Forest Insects - slash pine ecosystem, SEFES, Olustee, FL.

OBJECTIVES

The objectives were to:

1. Determine the seasonal flight periods of male peach tree borer moths at Murphy and Asheville, NC for optimum timing of spray application.

2. Determine if a correlation exists between moth catches at these two sites.

MATERIALS AND METHODS

Pheromone traps consisted of screened boxes 2 1/2 feet (76 cm) square supported 2 feet above ground by a metal pole (cover photo). On each of the four vertical sides a funnel-shaped entrance hole was constructed.

We used one Conrel Dispenser loaded with 15-20 mg of ZZ-ODDA (96 percent ZZ, 4 percent EZ and other isomers) in each trap. These were provided by Ralph Gentry, SEA, SE Fruit and Tree Nut Research Station, Byron, Georgia.

The pheromone dispenser was attached to the metal pole about 4 inches (10 cm) above each entrance hole. A 6-inch (15 cm) wide strip of plastic was attached at the top of the trap. A Shell No-Pest Strip® was nailed inside the top cover on the trap located at Asheville. The trap at Murphy did not have a pest strip.

Male moths were collected three times each week from mid-May through September in Asheville, while at Murphy collections began June 16 and continued through September.

The number and species of captured moths were recorded for each collection date for both traps. One trap was located at the Asheville Field Office, S&PF, FIDM, Asheville, NC, and the other at the U. S. Forest Service Beech Creek Seed Orchard, Murphy, NC.

Statistical analysis consisted of computation of the correlation coefficient of trap catches between sites.

RESULTS

Four species from the clearwing moth family, Aegeriidae, were collected. These insects included the peach tree borer (PTB), lesser peach tree borer (LPTB) Synanthedon pictipes (Grote and Robinson), lilac borer Podosesia syringae (Harris), and the oak borer Paranthrene simulans (Grote). In Asheville, the predominant insects collected were male PTB's with a summer long total catch of 2209 (Table 1). This was also the case at Murphy, NC, where 766 were collected.

Table 1. Numbers and species of male clearwing moths collected in pheromone-baited traps located in Asheville and Murphy, NC - 1978

Species	Trap Location	
	Asheville, NC	Murphy, NC
Peach Tree Borer	2209	766
Lesser Peach Tree Borer	37	56
Lilac Borer	232	12
Oak Borer	1	0

In Asheville, the first peach tree borer was captured the week of May 19, while the last was collected September 29 (Fig. 1). At Murphy, the first moth was collected June 16 (the beginning of trap collection) and the last collected September 22. No moths were collected in October.

The peak moth collections for both trap sites occurred the week ending July 28. Major moth flights were recorded for 6 weeks from July 7 through August 18. Lesser, but still significant catches were recorded from June 16 through September 15--a period of about 3 months.

Statistical analysis showed the correlation coefficient (r) to be .9312 for weekly trap catches between trap locations. The coefficient of determination (r^2 = .8670), which is useful as a measure of the degree of association between two variables, is significant at the .0001 level.

DISCUSSION

This report documents continued male moth activity lasting about 4 months with major populations present for 6 weeks from July 7 through August 18. The present spray schedule of applying Thiodan® to the tree trunks on the Beech Creek Seed Orchard in late August leaves the trees unprotected for over 2 months.

The value of these ramets is of such a magnitude that the loss of even one tree is unacceptable. Tree mortalities on the orchard from peach tree borer attacks have been noted by orchard personnel, but not observed by entomologists from the Asheville Field Office. Nevertheless, male moth catches during the summers of 1977 and 1978 confirm the presence of this damaging insect on the Beech Creek Seed Orchard. Although the total catch at Murphy was much less than Asheville, the weekly pattern between the orchards was almost identical. A nearly normal distribution curve was formed by the weekly catches at each trap location. The main difference between locations

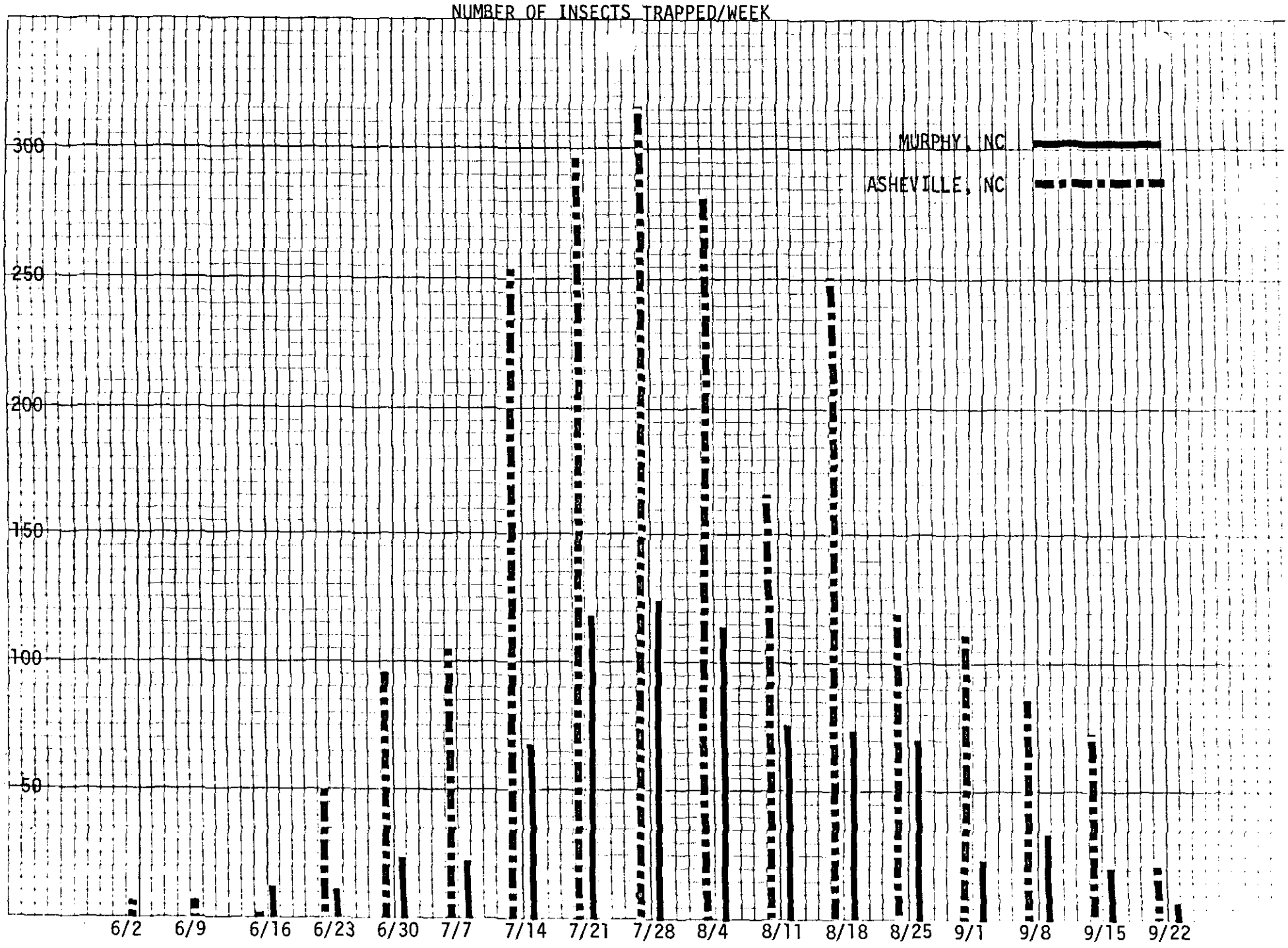


Figure 1. Male peach tree borer pheromone trap catches at two locations in North Carolina during 1978.

was, at Asheville about three times more male peach tree borer moths were caught. This does not mean, however, that insect populations are lower at the Beech Creek Seed Orchard. The trap in Asheville contained a Shell No-Pest Strip® which is believed to immobilize and kill the insects as they fly into the trap, therefore, few insects escaped. The plastic strip around the top of the trap kept the toxic vapors in the trap.

The emergence patterns at the two locations suggest changes are needed in the spray application timing. Dr. James D. Solomon[4/] (Personal Communication) suggests spraying July 1 and August 1 with Thiodan®. As an alternative to two sprayings, one application July 15 might suffice. For either one or two applications, the recommended insecticide is Thiodan®.

Due to the prolonged flight activity of the peach tree borer moths, the high value placed on the crop, and the fact that insect attacks often lead to tree mortality, two spray applications on the Beech Creek Seed Orchard are justified.

The possibility of using pheromone traps to control peach tree borers is presently being examined by Mr. Ralph Gentry. This technique holds promise for the future, but it cannot be recommended at this time because it is not proven.

RECOMMENDATIONS

1. Spray black cherry trunks July 1 and August 1 with Thiodan®.

2. Remove all plants in the Prunus genus (plum, black cherry, etc.) from within the orchard that are not part of the clone bank.

3. Report to the Asheville Field Office any stem attacks by the peach tree borer.

4. Continue the trapping program at Murphy, NC, to further document moth flight periods which will aid in future spray timing.

4/ James D. Solomon, USDA, Forest Service, Southern Hardwoods Laboratory, Southern Station, Gulfport, MS.

ACKNOWLEDGEMENTS

To Elinor Earle (USFS, FIDM, Asheville Field Office), Ed Manchester, Shirley Babcock and Glen Beaver (USFS, Beech Creek Seed Orchard) for collecting the field data.

To Ralph Gentry SEA, SE Fruit and Tree Nut Research Station for supplying the insect pheromone.

DISCLAIMER

Mention of trade names is solely to identify materials used, and does not constitute endorsement by the U. S. Department of Agriculture.